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ABSTRACT

This document consists of three related items. The first brief paper describes the components of a cumulative daily review program and its origins, rationale, and outcomes. The review-as-you-go (RAYG) format entails planning cumulative examinations and providing review problems each day. The procedure once was routinely used; today it is exemplified in textbooks by Saxon and by Rhoad et al. The rationale is based on research that study followed by sleep followed by examination produces better achievement. The benefits of a RAYG approach are more pronounced for students of lower ability. Teaching, skill learning and retention, conceptual understanding, and new discovery can all be expected to improve with use of RAYG. Five suggestions for teachers are noted, and 14 references are included. The second paper describes procedures for the Oklahoma City Public Schools when using Saxon's books, and a model for structuring the algebra course based on Saxon's algebra books. The third paper is a test for grade 7 incorporating RAYG. (MNS)

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"Review As You Go: Oklahoma City Public Schools' Plan
Using Saxon's Procedures"

Stan Hartzler
Oklahoma City Public Schools

1984

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MAXIMIZING MATHEMATICS (LEARNING AND DEVELOPMENT) THROUGH REVIEW
Stan Hartzler, Ph.D., Mathematics Education; OKC Public Schools

Two independent authors of high school mathematics textbooks have recently produced textbooks which are historically unique in similar ways (1,2). Featured are exercise sets which pertain to more than the discussion immediately preceding. These exercise sets contain review problems, so that a student reviews, each day, virtually the entire course covered so far. The implications of this change for the format of the textbook are strong, as are the positive effects on student achievement(3-7). The merits of this daily review arrangement are not widely known at this time. The purpose of this paper is to help describe the components of a cumulative daily review program, present-day and historical origins, why the system works, evident Aptitude-Treatment Interaction (ATI), outcomes, and a suggested activity for day-to-day classroom implementation.

Components. A teacher embodies a RAYG (review as you go) format first by planning cumulative examinations. Several Oklahoma City science teachers include a verbatim review question from a previous exam worth ten per cent of the grade for every new examination. This insures first that students will accurately correct any mistakes made on each exam as it is discussed on the day it is returned. Second, a student will review each exam as part of preparation for any upcoming exam. By the end of the year, the student knows the course material.

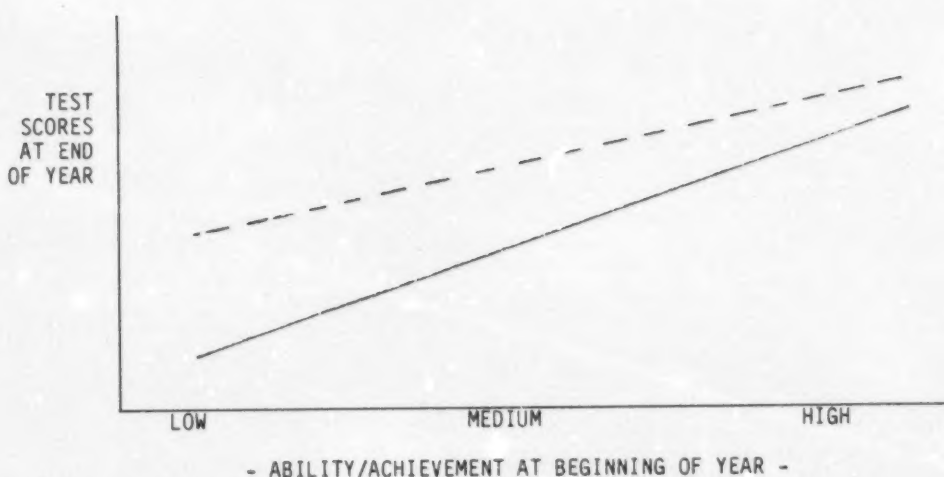
In mathematics, cumulative exams should be supported by the teacher providing review problems each day. In textbooks with daily review exercises, this is already done for the teacher. Research evidence casts doubt on the procedure of assigning problems requiring turning back to previous pages in the textbook, whereby students find the problems and the methods of solution simultaneously(8,9). With a RAYG textbook format, or with a teacher writing review problems on the board, overhead, or handout sheets, the problem is first established in a student's mind before clues or other help is sought, and the latter procedures are evidently more successful.

Origins. The two authors mentioned above happened upon RAYG teaching in mathematics in different ways, one through a common-sense response to students forgetting from week to week, and the other from an associate whose results on the department exam far surpassed those of her colleagues in one of the nation's top high schools(10). The testimony of other respected teachers who have likewise used RAYG is not hard to find. Addison-Wesley manager Robert Kelly testifies that RAYG exercise assignments were routinely used many years ago(11). Evidently recent literature and methods courses have allowed the issue to fall between the cracks. Recent research evidence addresses and supports a related technique called distributed homework practice(12), but this related evidence is not widely known.

Rationale. Why does RAYG work as it does? Fifty years of research on learning shows that sleep improves memory. Study followed by sleep followed by examination produces better gains for almost everyone than sleep followed by study followed by examination. The term "review" (unlike "repetition") implies that unrelated activity, probably sleep, occurs between different study periods. An elementary student helped by RAYG will do a division problem one day, sleep that night, do another the next day, sleep that night, and so on all year. Teachers are thus encouraged to supply students studying fractions with one problem each of whole number addition, subtraction, multiplication, and division, each day, to avoid lengthy reteaching. Students frightened by the idea of fractions will still be able to face math period knowing that success will at least be encountered on four problems each day. Slower students will get needed extension of opportunity and exposure.

ATI.(13) Of particular interest to teachers of low achievers is an indication of aptitude-treatment interaction between student ability and relative effects of RAYG. The benefits of a RAYG approach are more pronounced for the student of lower ability. If the assertion can be made that people learn by emotion, review, and association, it should be clear why the high achiever has less need for RAYG for learning low-order skills than low achievers: high achievers have already learned more, and have more facts and concepts already in their minds with which to associate new learning for ready recall and further conceptualizing. The low achiever cannot learn as well by association, having less with which to associate, and must learn by review, given that emotion may be involved in the motivation of learning mathematics, but as yet never in the actual learning process. Manipulatives and other concrete reference frames allow visualization to discover or explain facts, but the retention of facts still occurs by association or review.

The illustration which follows describes this interaction. The solid line represents the end-of-year achievement of low, medium, and high ability students taught as a textbook indicates. The dotted line indicates the improved achievement of the same students, same teacher and book, with RAYG.



- Outcomes. The following can be expected to improve with use of RAYG:
1. TEACHING. Intuitively, it should be clear that teaching advanced ideas based on prerequisite knowledge is easier. Development of the quadratic formula is easier if on the previous day the students reviewed solving a quadratic by completing the square and addition of algebra fractions.
 2. SKILL LEARNING AND RETENTION. Students learn by RAYG as achievement tests are written -- different problems side by side. More content is covered, though the opposite often seems true in the first two or three months.
 3. CONCEPTUAL UNDERSTANDING. "...To consider related facts simultaneously ... is a necessary condition for higher-order cognitive processes such as inferencing, summarizing, and decision-making." (14) A year of algebra RAYG leaves students thinking like algebraists in addition to retaining facts and skills.
 4. NEW DISCOVERY. The author's use of a type of flexagon as a new model for a group is left as an example.

Suggested Activity. Teachers might attempt to employ RAYG with the following:

1. Put five or so different problems on the board or overhead before class.
2. Let students work on problems 2-3 min. while teacher does keeping (attendance, hand back graded papers, etc.).
3. Do problems for students for review instruction.
4. Collect papers for effort grade. Teacher should collect papers prior to step 3 once a week or so for credibility. Students might also exchange papers prior to step 3.
5. Go on with regular class work. Once routine is established, RAYG should be over 5-6 min. after beginning bell has rung.

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OKLAHOMA CITY PUBLIC SCHOOLS

When using Saxon's books

1. Test a week behind the class coverage. If today you are on lesson 50 and want to test tomorrow, let the test cover lessons 1-45. See the explanation in the test booklet sold with the book.

Corollary 1.1 Use no class days to review for tests, since review is a way of life. A logical extension of this is that eventually math teachers will be able to cover more content each year in every class.

2. Test cumulatively as indicated above.

3. Keep moving, at 3-4 lessons per week. It will feel like not enough problems are given each night, but ignore that feeling. As long as you keep moving, the students will get enough problems distributed over time -- and that's one of the key to the improvement students get from the book.

4. Get ready to discuss a little bit (five minutes) from a new lesson and also from two or three previous lessons each day.

5. When explaining a new lesson, concentrate on how to do the problems. Cover the bulk of the why on the next day.

6. Call parents, collect papers for quick "effort" grades, and so on as often as needed to keep the students doing the problems. Tell them how important math and especially algebra is in the new technical society. A one-time farm society turned to factories is now only 20% employed in factories. Algebra is the fundamental language of science and programming, etc.

7. Tell your elementary teachers to review a bit each day. Following is a sample format. Your algebra students will be better prepared if you get review support from all teachers in the earlier grades.

- A. Put five or so different problems on the board or overhead before class
- B. Let students work on problems 2-3 min. while teacher does housekeeping (attendance, hand back graded papers, etc.)
- C. Do problems for students for review instruction
- D. Collect papers for effort grade. Teacher should collect papers prior to step 3 once a week or so for credibility. Students might also exchange papers prior to step 3.
- E. Go on with regular class work. Once routine is established, RAYG should be over on 5-6 minutes.

8. Expect this from Saxon's review methods:

A. Better skill performance on achievement tests. Finally, students are learning and being tested as achievement tests are written: contrasting types of problems are presented side-by-side.

B. More ease in teaching advanced ideas based on prerequisite knowledge which is now adequately reviewed.

C. Better conceptual understanding. Research says that concepts are developed only where contrasting types of problems are presented to the student side-by-side, day after day. A year of this approach leaves students thinking like algebraists in addition to remembering the skills.

OKLAHOMA CITY PUBLIC SCHOOLS

Model for Course Structure
Based on Saxon's Algebras
Dallas Public Schools
January 28, 1984

Dr. Stan Hartzler, OKC Public Schools

1. Decide objectives and sequence

2. Find 3-10 initially independent strands or "chapters"

Examples:

(Elementary)

- a) Names for numbers $a_1, a_2, a_3, \dots$
- b) Counting $b_1, b_2, b_3, \dots$
- c) Place value
- d) Facts
- e) Pencil-paper numbering
- f) Algorithms

(Secondary)

- a) algebra variables - purpose
- b) order or operations
- c) expressions
- d) equations
- e) word problems
- f) graphing

(Intermediate)

- a) Whole number reading and rounding
- b) Whole number operations
- c) Fraction reducing
- d) Fraction Operations
- e) Fractional parts of numbers
- f) Decimal orientation

3. Plot:

Day	Unit introduced	Problems/activities
1	a_1	a_1
2	b_1	a_1, b_1
3	c_1	a_1, b_1, c_1
4	d_1	a_1, b_1, c_1, d_1
5	a_2	a_1, b_1, c_1, d_1, a_2
6	b_2	$a_1, b_1, c_1, d_1, a_2, b_2$
7	c_2	$a_1, b_1, c_1, d_1, a_2, b_2, c_2$
8	d_2	$a_1, b_1, c_1, d_1, a_2, b_2, c_2, d_2$
9	(cushion: unify, etc.)	$a_1, b_1, c_1, d_1, a_2, b_2, c_2, d_2$
10	a_3	$a_1, b_1, c_1, d_1, a_2, b_2, c_2, d_2, a_3$
11	test over first 7 days	a
12		a
13	a_4	a

4. Considerations

- a. Start as many topics/chapters/units/standards/strands as soon as possible.
- b. Review-as-you-go, and systematically eliminate to keep total problems under control.
- c. Cushion occasionally with wrapup discussion, nothing really new, but exercises like the previous day's.
- d. Keep an eye on prerequisites.
- e. Keep an eye on student needs, foremost of which is to review.
- f. Test one week behind the coverage, and make the tests cumulative.

7TH GRADE RAYC + CAT

- ① FIND THE SUM:

$$\begin{array}{r} 371 \\ 123 \\ \hline \end{array}$$
- ② FIND THE DIFFERENCE:

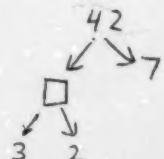
$$\begin{array}{r} 5631 \\ 2017 \\ \hline \end{array}$$
- ③ FIND THE PRODUCT:

$$\begin{array}{r} 8613 \\ \times 747 \\ \hline \end{array}$$
- ④ FIND THE QUOTIENT:
 $241 \div 8$
- ⑤ WRITE THE MISSING NUMBER:
 $3, 7, \_, 15, 19, 23$

- ① FIND THE SUM:

$$\begin{array}{r} 2439 \\ 157 \\ 6848 \\ \hline \end{array}$$
- ② FIND THE DIFFERENCE:

$$\begin{array}{r} 6003 \\ 1897 \\ \hline \end{array}$$
- ③ FIND THE PRODUCT:

$$\begin{array}{r} 605 \\ \times 20 \\ \hline \end{array}$$
- ④ FIND THE QUOTIENT:
 $876 \div 20$
- ⑤ COMPLETE THIS FACTOR TREE:


- ① FIND THE SUM:
 $4 + (3 + 8) =$
- ② FIND THE DIFFERENCE:

$$\begin{array}{r} 2000 \\ 1217 \\ \hline \end{array}$$
- ③ FIND THE PRODUCT:

$$\begin{array}{r} 2040 \\ \times 93 \\ \hline \end{array}$$
- ④ DIVIDE 879 BY 26.
- ⑤ COMPLETE: $2.6 \times \_ = .607 \times 2.6$

- ① FIND THE SUM:

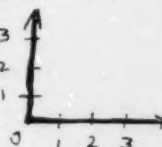
$$\begin{array}{r} 76 \\ 599 \\ 208 \\ 91 \\ \hline \end{array}$$
- ② FIND THE DIFFERENCE:

$$\begin{array}{r} 5906 \\ 2419 \\ \hline \end{array}$$
- ③ FIND THE PRODUCT:

$$\begin{array}{r} 562 \\ \times 663 \\ \hline \end{array}$$
- ④ DIVIDEND: 644
 DIVISOR: 23
 QUOTIENT = ?
- ⑤ THERE ARE 100 CM. IN 1 METER. HOW MANY CM. IN 6 METERS?

- ① $345 + 56 + 32 + 1361 =$
- ② FIND DIFFERENCE:

$$\begin{array}{r} 8000 \\ 2999 \\ \hline \end{array}$$
- ③ FIND PRODUCT OF $\frac{5}{2}$ and $\frac{7}{5}$
- ④ FIND QUOTIENT:
 $8 \overline{) 6539}$
- ⑤ MARK THE POINT (0,0) WITH A DOT.

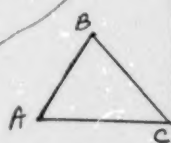


- ① SUM $\frac{2}{8}$ and $\frac{3}{8}$
- ② FIND DIFFERENCE:

$$\begin{array}{r} 90853 \\ 32265 \\ \hline \end{array}$$
- ③ FIND PRODUCT OF $\frac{5}{9}$, $\frac{9}{20}$, and $\frac{16}{25}$
- ④ DIVIDE 241 BY 37.
- ⑤ $6^4 = ?$

- ① SUM $\frac{7}{9}$ and $\frac{3}{9}$
- ② FIND THE DIFFERENCE:

$$\begin{array}{r} 10\frac{1}{2} \\ 1\frac{5}{8} \\ \hline \end{array}$$
- ③ FIND PRODUCT OF $\frac{7}{20}$ and $\frac{9}{20}$
- ④ FIND $1\frac{3}{4} \div \frac{5}{8}$
- ⑤ DRAW THE LINE WHICH SHOWS THE HEIGHT OR ALTITUDE OF TRIANGLE ABC!



① SUM $\frac{1}{12} + \frac{3}{8}$ ② FIND DIFFERENCE: $2\frac{1}{2} - 1\frac{3}{5}$ ③ FIND PRODUCT: $6 \times \frac{11}{12}$

④ DIVIDE TO FIND QUOTIENT: $2\frac{1}{3} \div 7$

⑤ COMPLETE THE BOXES:
 $(8 \times 10^{\square}) + (5 \times 10^{\square}) + 3(10^{\square}) = 8053$

① SUM $2\frac{2}{3}$ and $6\frac{5}{6}$ ② FIND DIFFERENCE: $5\frac{7}{12} - 4\frac{3}{4}$ ③ FIND PRODUCT OF 49.72 AND .036

④ FIND QUOTIENT: $5407 \div 32$

⑤ ROUND 67492 TO NEAREST HUNDRED

① SUM $4\frac{3}{4}$ and $\frac{3}{4}$ ② FIND DIFFERENCE: $7\frac{3}{5} - 4\frac{1}{6}$ ③ FIND PRODUCT OF 3,000 AND .0009

④ DIVIDE 2804 BY 7.

⑤ IF A RECTANGLE HAS AREA 91 and LENGTH 7, FIND WIDTH.

① FIND SUM OF $24\frac{2}{5}$ AND $10\frac{3}{8}$ ② FIND DIFFERENCE: $8050 - 2423$ ③ FIND PRODUCT: 47613 AND 2015

④ DIVIDE LARGER BY SMALLER: $\frac{3}{4}, 4\frac{1}{2}$

⑤ WHICH EQUALS 1?
 $\frac{1}{2} \div \frac{1}{2}; \frac{1}{3} + \frac{1}{3}; \frac{5}{2} - \frac{2}{5}; 2\frac{1}{2} \times \frac{2}{5}; \frac{3}{4} \times \frac{3}{4}$

① SUM 6.7 and 1.82 ② FIND DIFFERENCE: $6\frac{1}{4} - 3\frac{5}{8}$ ③ FACTOR AND FIND PRODUCT: $\frac{25}{40} \times \frac{80}{100}$

④ IF $7\frac{1}{6}$ IS THE DIVIDEND, AND $5\frac{1}{4}$ IS THE DIVISOR, FIND THE QUOTIENT.

⑤ FIND DIAMETER OF A CIRCLE WITH RADIUS 6.

① $1.0034 + 10.9 + 204.58 =$ ② $8\frac{1}{3} - 1\frac{3}{4} =$ ③ FIND PRODUCT: 8.888×7.77

④ $16 \overline{) 94}$

⑤ IF $y = 2x + 1$, what is y when $x = 62$?

① SUM .7 + 8.829 ② FIND DIFFERENCE: $5\frac{1}{10} - 2\frac{4}{5}$ ③ $(103)^2 =$

④ DIVIDE $5342 \div 101$

⑤ DRAW A SEMICIRCLE

① SUM $.8 + 7 + .06 + .171$

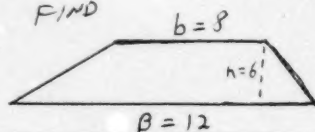
② FIND DIFFERENCE:
 $8.01 - 4.32$

③ FIND PRODUCT:
 $3\frac{5}{6} \times 6 =$

④ DIVIDE $2\frac{4}{5}$ BY $3\frac{6}{7}$

⑤ THE AREA OF A TRAPEZOID IS FOUND BY $\left(\frac{B+b}{2}\right)h$. FIND

THE AREA



① SUM $\frac{3}{8} + \frac{2}{8}$

② FIND DIFFERENCE:
 $12.16 - 11.61 =$

③ FIND PRODUCT: $673.2 \times 1,7002$

④ $931 \div 56 =$

⑤ WHAT IS THIS FIGURE?



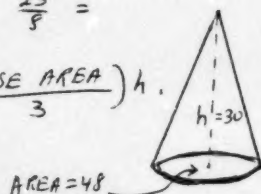
① SUM 6 and 9.24

② FIND DIFFERENCE:
 $3.9 - 2.46 =$

③ FIND THE PRODUCT:
 $\frac{16}{5} \times \frac{25}{8} =$

④ FIND QUOTIENT:
 $9 \div 4\frac{1}{3}$

⑤ VOLUME OF A CONE = $\left(\frac{\text{BASE AREA}}{3}\right)h$.
FIND VOLUME:



① FIND THE SUM OF
 $1\frac{3}{8}$ AND $3\frac{1}{2}$

② FIND THE DIFFERENCE:
 $6.8 - 2.439$

③ FIND PRODUCT:
 943.006 AND 1.23

④ DIVIDE 212 INTO 843.

⑤ IF YOU GET PAID \$2000 PER MONTH, HOW MUCH DO YOU GET PAID IN A YEAR?

① FIND THE SUM:
6.1 .07 3.89

② FIND DIFFERENCE:
 $9000 - 2465$

③ MULTIPLY:
 $\frac{4}{5} \times \frac{2}{9} \times \frac{3}{4} \times \frac{7}{15}$

④ COMPUTE:

$8\frac{6}{7} \div \frac{2}{3}$

⑤ CIRCLE THE WORDS WHICH DESCRIBE 6:

PRIME NEGATIVE COUNTING
NATURAL ODD COMPOSITE
EVEN POSITIVE

① SUM $\frac{3}{8}$ and $\frac{2}{8}$

② FIND DIFFERENCE:
 $8\frac{1}{4} - 3\frac{5}{9}$

③ FIND PRODUCT OF
76.6 and .006

④ FIND QUOTIENT:
 $\frac{326}{52}$

⑤ IF YOU PAINT 20 EGGS AND LEAVE 5 ALONE, WHAT PERCENT OF THE TOTAL ARE LEFT ALONE?

① SUM 1.824, 2.345, AND 6.716.

② FIND THE DIFFERENCE:
 $8.119 - 1.67$

③ FIND PRODUCT:
.00052 x .203

④ DIVIDE 1338 BY 35.

⑤ THE LOWEST COMMON DENOMINATOR FOR $\frac{3}{4}$ AND $\frac{3}{10}$ IS ?

① SUM $2\frac{1}{2}$, $\frac{1}{2}$, and $4\frac{1}{2}$

② SUBTRACT .245 FROM .3

③ FIND PRODUCT OF $\frac{17}{24}$ and 56

④ DIVIDE:

$51\frac{1}{2} \div 16\frac{1}{4}$

⑤ IF TWO TRIANGLES ARE SIMILAR, WHAT ELSE IS TRUE?

a. THEY ARE CONGRUENT

c. THE CORRESPONDING ANGLES ARE EQUAL

b. THE PERIMETERS ARE EQUAL.

d. THE AREAS ARE EQUAL.

22

① SUM 6, 8.2, .003

② SUBTRACT $4\frac{3}{4}$ FROM $6\frac{1}{3}$

③ DIVIDE 6.2 INTO 582.8

④ WHAT IS $5\frac{3}{7}$

DIVIDED BY $\frac{3}{8}$?

⑤ THE PERIMETER OF A REGULAR HEXAGON (SIX EQUAL SIDES) IS 210. HOW LONG IS EACH SIDE?

23

① ADD $\frac{3}{8}$ and $\frac{1}{4}$

② SUBTRACT $6\frac{5}{8}$ FROM $9\frac{5}{12}$

③ FIND PRODUCT: $1\frac{1}{2} \times \frac{8}{9}$

④ DIVISOR = 843
DIVIDEND = 70,328
QUOTIENT = ?

⑤ THE NUMERAL 2 IN THE NUMBER 631.23 STANDS FOR WHAT -- HUNDREDS, TENS, ONES, TENTHS, OR HUNDREDTHS?

24

① SUM 2.3, 4.8, .01, and .001

② FIND THE DIFFERENCE: $48.3 - 24.158$

③ FIND THE PRODUCT: 63.17×188.2

④ DIVIDE $8\frac{1}{9}$ BY $\frac{2}{11}$

⑤ CIRCLE THE TRUE STATEMENTS:
.271
.023 > .16
 $2.3 < .65$
 $2.6 = 1 + 1.6$

25

① ADD $6\frac{7}{10}$ TO $7\frac{3}{5}$

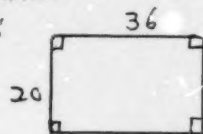
② SUBTRACT 14151 FROM 53020

③ DIVIDE 11.016 BY 12

④ FIND THE QUOTIENT:

$2\frac{1}{2} \div 1\frac{7}{8}$

⑤ FIND PERIMETER AND AREA:



26

① SUM $2\frac{3}{4}$, $1\frac{1}{6}$, and $4\frac{5}{12}$

② SUBTRACT $2\frac{11}{12}$ FROM $4\frac{3}{4}$

③ MULTIPLY: $2\frac{1}{9} \times 3\frac{2}{3} \times 1\frac{4}{7}$

④ COMPARE: $\frac{7\frac{1}{3}}{5}$

⑤ SIMPLIFY:
 $(2 \times 10^4) + (9 \times 10^3) + (3 \times 10^1) + 7 =$

27

① SUM $16 + 13.2 + 1.2 + 4.801$

② SUBTRACT 7.238 FROM 33.8

③ FIND PRODUCT OF .9427 x 10,000

④ DIVIDE 6 INTO 156

⑤ CIRCLE THE PRIME NUMBERS:

6 10 1 7 91
10 23 50 51 49 47

28

① $\frac{2}{9} + \frac{5}{9} =$

② SUBTRACT THE SMALLER OF $\frac{1}{4}$ and $\frac{1}{5}$ FROM THE OTHER.

③ $.98 \overline{) 6.076}$

④ DIVIDE $4\frac{1}{2}$ INTO $4\frac{3}{4}$

⑤ WRITE WITH NUMERALS: THREE HUNDRED AND SIXTY-ONE THOUSANDTHS. (ANSWER: 300.061)

29

① SUM $\frac{11}{12}$, $\frac{2}{3}$, and $\frac{5}{6}$

② FIND DIFFERENCE: $7 - 2.335$

③ $4\frac{1}{5} \times 5 \times \frac{1}{2} =$

④ DIVIDE THE SMALLER INTO THE LARGER:

⑤ There are 6 alley cats in the pack of 20 cats. What is the ratio of the alley cats to the others? (Answer: $\frac{6}{14}$ or $\frac{3}{7}$)

30

.15 .3 (ANSWER: 2)

① SUM 246.01, 41.321, 6, and .421

② SUBTRACT $\frac{3}{4}$ FROM 6.

③ FIND PRODUCT: $\frac{1}{7} \times \frac{7}{8} \times \frac{4}{5}$

④ DIVIDE $\frac{3}{8}$ BY 4.

⑤ A DEPOSIT IS LIKE AN ADVANCE PAYMENT. IF YOU LEAVE A DEPOSIT OF \$50 ON SKIS, AND RENT THEM AT \$20 PER DAY FOR 4 DAYS, HOW MUCH DO YOU OWE?

31

① ADD $\frac{1}{8}$ and $\frac{2}{3}$

② TAKE 2.34 FROM 65.

③ FIND THE PRODUCT: $4\frac{1}{3} \times 1\frac{7}{8} \times 15$

④ WHAT IS 19405 DIVIDED BY 36?

⑤ AVERAGE 20, 17, 26, and 31?

32

① SUM 462.3, 5, 8.6, 23.04, and 2.

② TAKE 7645 FROM 82231

③ FIND PRODUCT: $19.9 \times .82$

④ DIVIDE THE SMALLER BY THE LARGER:

$\frac{9}{10} \div \frac{7}{8}$

⑤ HOW MANY .05-gram bits can be chopped from a 2-gram bar of steel?

33

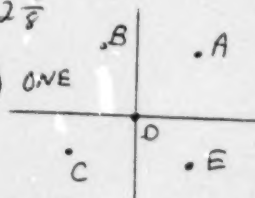
① SUM $\frac{1}{46} + \frac{1}{46}$

② SUBTRACT $\frac{5}{12}$ FROM $\frac{7}{8}$.

③ FIND THE PRODUCT: $(\frac{4}{7} \times 7) \times 2\frac{3}{8}$

④ DIVIDE 368 BY 14

⑤ WHICH POINT(S) HAS (OR HAVE) ONE POSITIVE AND ONE NEGATIVE COORDINATE? (ANSWER: B and E)



34

① SUM 8762.341 + 241.46

② SUBTRACT THE SMALLER FROM THE LARGER: .98 or 1.0

③ $441 \times .008 =$

④ $\frac{11}{12} \div \frac{7}{12} =$

⑤ If a trip to the bank and back is 6 miles total, how far is it just to the bank?

35

① SUM $\frac{1}{25}$ and $\frac{3}{25}$

② SUBTRACT $2\frac{2}{8}$ FROM 8.

③ $.35 \times .22 =$

④ $931 \div 56 =$

⑤ ROUND 82,949 TO NEAREST THOUSAND.

36

① SUM: 2365.81; 462.83; 21; .34

② FIND DIFFERENCE: $9 - 2.46$

③ $1.8 \div 72 =$

④ $2\frac{5}{7} \div 1\frac{1}{3} =$

⑤ DRAW A TRIANGULAR PRISM, AND THEN DRAW A RECTANGULAR PRISM.

37

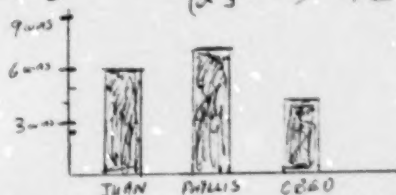
① SUM: $1\frac{45}{81} + 5\frac{5}{81} =$

② $45\frac{3}{11} - 15\frac{2}{3} =$

③ $(2\frac{1}{3} \times 6) \times \frac{11}{12}$

④ DIVIDE LARGER BY SMALLER: 417; 47

⑤ WHICH PERSON WON 4 TIMES?



38

① $18.34 + 9.6 + 248.3 =$

② FIND DIFFERENCE: $4.5 - .6733$

③ DIVIDE $9\frac{7}{8}$ BY $4\frac{1}{2}$

④ FIND THE PRODUCT: $48.9 \times .57$

⑤ FACTOR 450 USING A FACTOR TREE

39

① SUM $4\frac{5}{12}$ and $\frac{7}{12}$ and $\frac{5}{6}$

② SUBTRACT .3466 FROM 65

③ DIVIDE .288 BY .08

④ $630 \overline{)4910}$

⑤ FIND PERIMETER AND THEN AREA OF A SQUARE WITH SIDE .2

40